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Diversification of methodologies and experiences in dental sculpture monitoring: an experience report

Diversificação de metodologias e vivências na monitoria de escultura dental: relato de experiência

Diversificación de metodologías y experiencias en la supervisión de la escultura dental: informe de experiencia

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Abstract:
Objective: to report the experience of diversifying methodologies and experiences in monitoring the Dental Sculpture curricular component in a Dentistry course. **Methods:** experience report carried out at the Universidade Federal da Paraíba, Brazil, between the second semester of 2024 and the first semester of 2025. **Results:** three selected student tutors participated. After an initial orientation meeting, 44 in-person monitoring sessions, 26 in-person Q&A sessions, and 117 virtual Q&A sessions were held for 42 tutored students. Five illustrative materials in PDF format (dental elements 21, 23, 24, 35, and 26) and five tutorial videos (dental elements 21, 23, 24, 35, and 36) were developed. Large sculpted wax models (26 centimeters) and plaster models (6 centimeters) were also made available on the workbenches for better understanding of the practices and better retention of knowledge. **Conclusion:** the offering of different teaching proposals through the monitoring program played an essential role in the academic, technical, and personal development of those involved. The experience in monitoring demonstrated growth for the students and empowered the tutors to develop content.
Keywords: Mentoring; Teaching materials; Sculpture; Tooth.

Resumo:
Objetivo: relatar a experiência da diversificação de metodologias e as vivências na monitoria do componente curricular Escultura Dental num Curso de Odontologia. **Método:** relato de experiência realizado na Universidade Federal da Paraíba, Brasil, entre o segundo semestre de 2024 e primeiro semestre de 2025. **Resultados**: participaram três monitoras selecionadas. Após reunião de orientação inicial, ocorreram 44 monitorias presenciais, 26 plantões tira-dúvidas presenciais, 117 plantões tira-dúvidas virtuais, para 42 monitorados. Foram elaborados cinco materiais ilustrativos em PDF (elementos dentários 21, 23, 24, 35 e 26) e cinco vídeos tutoriais (elementos dentários 21, 23, 24, 35 e 36). Também foram disponibilizados macromodelos esculpidos em cera (26 centímetros) e em gesso (6 centímetros) nas bancadas para melhor entendimento das práticas e melhor fixação do conhecimento. **Conclusão**: a oferta de diferentes propostas de ensino pela monitoria exerceu papel essencial na formação acadêmica, técnica e pessoal dos envolvidos. A vivência na monitoria mostrou crescimento aos acadêmicos e capacitou as monitoras a desenvolver conteúdos.
Palavras-chave: Tutoria; Materiais de ensino; Escultura; Dente.

Resumen:
Objetivo: relatar la experiencia de diversificación de metodologías y las vivencias en la supervisión del componente curricular Escultura Dental en un curso de Odontología. **Método:** informe de la experiencia realizada en la Universidade Federal da Paraíba, Brasil, entre el segundo semestre de 2024 y el primer semestre de 2025. **Resultados**: participaron tres monitoras seleccionadas. Tras una reunión de orientación inicial, se realizaron 44 tutorías presenciales, 26 turnos de atención presenciales para resolver dudas y 117 turnos de atención virtuales para resolver dudas, para 42 alumnos. Se elaboraron cinco materiales ilustrativos en PDF (elementos dentales 21, 23, 24, 35 y 26) y cinco vídeos tutoriales (elementos dentales 21, 23, 24, 35 y 36). También se pusieron a disposición macromodelos esculpidos en cera (26 centímetros) y en yeso (6 centímetros) en las mesas de trabajo para una mejor comprensión de las prácticas y una mejor fijación de los conocimientos. **Conclusión**: la oferta de diferentes propuestas de enseñanza por parte de los monitores desempeñó un papel esencial en la formación académica, técnica y personal de los participantes. La experiencia en la tutoría demostró el crecimiento de los académicos y capacitó a los monitores para desarrollar contenidos.
Palabras-clave: Tutoría; Materiales de enseñanza; Escultura; Diente.

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INTRODUCTION

The academic monitoring project has established itself as a significant educational strategy, essentially due to its potential to promote the improvement and development of pedagogical skills and refine the range of knowledge of the students involved in the activity[1]. By establishing such an educational tool within the experiences of Health courses, focusing on Dentistry, monitoring assumes an even more relevant function, contributing to the mediation between theoretical knowledge and practical manual skills, assisting in the creation and evolution of technical skills indispensable to the professional's training[2].

The experience of academic monitoring inserts the student into a reality that encourages them to develop and apply methods that facilitate the teaching-learning process. This experience contributes to the tutor's autonomy, offers a practical view of teaching, and creates opportunities for the discovery of vocations, in addition to contributing to their technical, pedagogical, and didactic training[1].

By acting as a mediator between professors and students, the tutor enhances their communication, leadership, and empathy skills, ensuring the innovation of teaching methods, which brings students closer and captivates them in understanding the essential skills for both academic life and the job market[3].

The insertion of digital tools in the current context also highlights the influence of the internet on the teaching-learning of undergraduate individuals. The use of technologies in teaching, linked to monitoring, contributes to student autonomy, adds to the handling of doubts, and provides personalized management of time and place dedicated to study[4].

A study analyzed that students in their final year of university have greater visual knowledge of dental anatomy when compared to previous years; however, their performance in terms of theoretical knowledge is lower, suggesting the need to focus on this aspect and the importance of the Dental Sculpture curricular component for greater success in the professional's training[5]. In this way, 64% of students in their final year consider the updating and constant study of anatomy to be of great need for their clinical practice[6].

The Dental Sculpture curricular component requires students to have theoretical knowledge of dental anatomy in order to develop specific manual skills. Thus, appropriate techniques for the practice of progressive sculpture, combined with the continuous support of tutors and assistance from professors in the classroom, favor a more individualized and efficient learning experience[7]. The development of new manual skills and the creation of a collaborative teaching and learning environment in the practice of monitoring justify the application of digital

tools to benefit the experience of tutors and students. It is also necessary to discuss the methodologies adopted in the monitoring project, as well as the obstacles faced and the repercussions of this experience on academic training.

This study aims to report the experience of diversifying methodologies and the experiences in monitoring the Dental Sculpture curricular component in a Dentistry course.

METHODS

This is a descriptive account of the diversification of methodologies and experiences in monitoring the Dental Sculpture component of the Dentistry course at the Universidade Federal da Paraíba.

This type of study was chosen primarily because of the capacity of experience reports to produce knowledge from practical experience, focusing on critical reflection on acquired experiences and providing the construction of scientific knowledge in the educational field[8].

The monitoring project extended from the second semester of 2024 to the first semester of 2025, and was experienced by three tutors and 42 tutored students. The selection process for the tutors included a practical test of the wax-up of element 26 (First Upper Left Molar) articulated on a mannequin. Three candidates were ranked according to the descending order of the weighted average between the grade obtained in the selection exam, the grade obtained in the curricular component, and the Academic Performance Coefficient, with weights of 3, 2, and 1, respectively.

During the monitoring period, the book/e-book "*Anatomia e escultura dental*"[9] (Anatomy and dental sculpture) was used as an instrument, which offers an approach to dental structures and the theoretical basis for reproducing them in wax in a systematic and objective way. In addition, in-person and virtual (WhatsApp® application) Q&A sessions were held, and the materials used were: dental macromodels in plaster and wax, illustrative texts in PDF format, and videos with step-by-step instructions for wax-up.

RESULTS

The 44 in-person monitoring sessions played a significant role in consolidating theoretical content and improving students' manual skills, directly reflecting in improved performance on practical assessments. These activities allowed for individualized practice during coinciding free time between students and tutors.

Afterwards, the tutors remained in the lab once a week (a total of 26 in-person Q&A sessions) assisting with the steps of sculpting or with specific anatomical features that students

had more difficulty with, reviewing instructions, correcting technique, and pointing out mistakes.

The virtual Q&A sessions (approximately 117) took place on demand via a WhatsApp® group. This method facilitated continuous communication and quick clarification of doubts. Learning and retention of sculpting techniques and skills occurred through repetition both in the extra-curricular tutoring sessions and during students' study time at home. Therefore, the WhatsApp® group provided effective assistance. Through photos, videos, and audio messages, the tutors corrected and guided the students during the repetition of sculpting the elements at home in a more dynamic and faster way, with a decrease in the reproduction of errors.

During the classes in the Dental Sculpture curricular component laboratory, there were macromodels sculpted in wax (26 centimeters) and in plaster (6 centimeters) available on the benches for the students and used for demonstration by the professors and tutors. The use of dental macromodels contributed to a better understanding of anatomical structures, enhancing visual learning.

To expand the diversity of methods, 5 illustrative materials in PDF (dental elements 21, 23, 24, 35 and 26) and 5 tutorial videos (dental elements 21, 23, 24, 35 and 36) were developed. These were fundamental resources to strengthen the students' autonomy, facilitate technical memorization and promote greater manual dexterity. The materials were made available in the WhatsApp® group that contained the students. The PDFs were created following the e-book *Anatomia e Escultura Dental* - UFPB Publisher and the steps instructed by the professors in the laboratory. The 88 photographs, added to the instructions for each step of the sculpture of the dental elements taught, provided a theoretical, methodological and visual reference for the better construction of a logic during the sculpture process.

The tutorial videos were created by the tutor through video recording accompanied by simultaneous audio explanation, with a more dynamic approach to showing students how to sculpt or remember steps of the process. In this way, the integration between constant practice and the diversity of teaching resources contributed to the effectiveness of the teaching-learning process.

The combination of in-person and remote support fostered active and collaborative learning. There were weekly meetings (a total of 26) to guide the alignment of activities. These strategies reinforced the importance of hybrid and innovative educational approaches in dental education.

DISCUSSION

The monitoring activities served as a complementary space to teaching, allowing the consolidation of the content taught in the classroom and offering students the opportunity to clarify doubts in a more individualized way[10].

The in-person Q&A session contributed to the development of specific manual skills, in which students practiced the fabrication of dental elements and improved progressive waxing through repetition. It also allowed for more practice time focusing on the student's greatest difficulty, providing individualized teaching and greater adaptation to their needs.

Due to time constraints, online monitoring was also conducted through a group formed between students and tutors on the WhatsApp® application. The use of this tool created a virtual environment where teaching materials were shared more dynamically and students could resolve doubts more quickly. Therefore, the application acted as a facilitator of communication and connection between tutors and students, enabling closer and more agile monitoring of individual needs[11].

Dental macromodels were support tools that allowed tangible and enlarged visualization of the structures to be reproduced, such as cusps, grooves, and ridges. With their display on the benches, they enabled students to visualize and identify anatomical features, as well as assisting in the explanations provided by professors and tutors during classes and extracurricular monitoring. In the integration between the contents of Dental Sculpture and Removable Partial Denture, the macromodels enhanced the morphological understanding of anatomical structures and the visualization of the location of the preparations for the denture niches[12].

The use of large-scale macromodels is justified in demonstrations further away from the students, while smaller models were used for direct consultation by students during practice, favoring the assimilation of dental morphology[13].

Another relevant aspect for the teaching-learning process, both for the tutors and the students, was the creation of illustrative materials in PDF format with step-by-step instructions for wax plating. This resource was a pedagogical support tool, contributing to the clarification of remaining doubts and to the consolidation of the didactic sequence. From this perspective, it was evident that the production of didactic materials of this nature contributed to the student's autonomy, encouraging them to assume an active role in the construction of their own knowledge, while also favoring the development of critical thinking and engagement with the curricular component[14].

Given the need to restructure teaching and learning strategies, the dissemination of materials through digital tools represented a dynamic and reflective strategy[15]. The production

of step-by-step tutorial videos on wax-up has proven to be beneficial for memorization and the development of manual dexterity, broadening the scope of learning. In a previous study[16], it was observed that students had difficulty understanding and reproducing the steps of dental sculpting after watching the demonstration only once. Therefore, the videos enabled access to information at flexible times for independent study without a professor.

The monitoring project proved essential for consolidating the knowledge of those involved: for the tutors, it favored improvement, knowledge retention, teamwork skills, leadership, communication and encouragement of teaching[17]; for the students, the diversification of methodologies contributed to autonomy for spaced repetition, directly reflecting on better performance in practical assessments; for the professors, it enhanced the teaching-learning process, allowed academic cooperation, creating a collaborative environment capable of supporting, inspiring and welcoming mentors and students.

Thus, when applying such methodologies to the teaching of techniques associated with the construction of dental anatomy, it became clear how much practice contributed to the retention of the content, becoming indispensable for future clinical practice in Dentistry[7]. It is believed that the monitoring sessions contributed positively to the retention of the anatomical characteristics of the teeth. The evaluation of the experience by both professors and students was positive, as it allowed for mutual exchange and enriched academic training.

CONCLUSION

The diversification of methodologies played an essential role in the academic, technical, and personal development of those involved. The experience in monitoring ensured growth for the academic journey, providing opportunities to deal with different social groups and enabling the tutor to make content more dynamic, as well as individualize teaching for better understanding of the student's knowledge.

The limitation of this report refers to the difficulty of discussing it with current similar studies. The practical implications for the thematic area include the encouragement of new methodologies in the academic environment, to make teaching more attractive. The suggestion for future research involves the application of quantitative data collection instruments to evaluate the effect of the diversification of methodologies in the teaching-learning process of dental sculpture.

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